

CLAIMS

1. A Digital Subscriber Line Access Multiplexer (DSLAM) comprising:

5 a network side interface adapted to receive a plurality of communication signals conveyed along a broadband network;

a storage means adapted to receive at least some of said plurality of communication signals, associate
10 corresponding priorities with the communication signals received thereat, and store their content in accordance with at least one of the associated priorities;

multiplexing means operative to retrieve content stored in said storage means and multiplex the content
15 thus received with run time data received at said network side interface into a multiplexed product, wherein said operation is carried while ensuring a minimum pre-defined quality of service for the multiplexed product;

a subscribers' output interface adapted to receive
20 said multiplexed product from the multiplexing means and forward it along a communication line extending towards a subscriber; and

a subscribers' input interface adapted to receive information generated by subscribers.
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2. A DSLAM according to claim 1, wherein said retrieval of content stored in said storage means is carried in response to information received from one or more of the subscribers.
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3. A DSLAM according to claim 1, wherein said pre-defined quality of service is determined based on a type of application characterizing the content of said multiplexed product.
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4. A DSLAM according to claim 1, wherein the priority associated with said communication signals is based on a type of application by which the contents of said communication signals would be utilized.

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5. A DSLAM according to claim 1, wherein said communication signals are selected from the group consisting of: data signals, video signals, facsimile signal, unicast video signals, multicast video signals, audio signals, voice signals and any combination thereof.

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6. A DSLAM according to claim 1, wherein said subscriber's output interface is further adapted to forward said multiplexed product in accordance with a bandwidth associated with said subscriber's communication line.

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7. A DSLAM according to claim 1, wherein said subscriber's output interface is further adapted to forward said multiplexed product in accordance with priorities associated with at least one of the components comprising the multiplexed product.

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8. A DSLAM according to claim 1, wherein said subscriber's output interface is further adapted to forward said multiplexed product in accordance with a priority assigned to the multiplexed product by said multiplexing means.

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9. A DSLAM according to claim 1, wherein application of a personal video recording is implemented by storing at said storage means part or all of multicast video streams, based on subscribers' commands.

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10. A DSLAM according to claim 1, wherein said multiplexed product is a video stream adapted to be shared by a plurality of subscribers.

5 11. A DSLAM according to claim 1, wherein said storage means is further operative to allocate storage space to store the content of each of the communication signals that are stored.

10 12. A DSLAM according to claim 8, wherein said multiplexing means is further adapted to classify said multiplexed product in accordance with pre-defined criteria and assign priority to said multiplexed product in accordance with that classification.

15 13. A DSLAM according to claim 12, wherein said priority is assigned so as to assure a minimum quality of service required for the type of classification associated with said multiplexed product.

20 14. A DSLAM according to claim 12, wherein the priority assigned to the multiplexed product is dependent upon at least some of the bandwidth limitations existing along the communication line extending towards the subscriber.

25 15. A DSLAM according to claim 1, further comprising a storage adapted to hold a plurality of multicast video signals and identify at least one of said multicast video signals that is in conformity with information generated
30 by a subscriber and received at said subscribers' input interface.

35 16. A DSLAM according to claim 15, further adapted to unicast said at least one of said video signals identified, to the subscriber generating the information.

17. A DSLAM according to claim 15, wherein the information generated by the subscriber is derived from a change in a channel being viewed.

5 18. A DSLAM according to claim 3, wherein said storage means are adapted to allocate a pre-defined storage space for storing incoming communication signals.

10 19. A DSLAM according to claim 18, wherein said allocation is made in accordance with the type of application characterizing the content of said incoming communication signals.

15 20. A DSLAM according to claim 18, wherein any information to be stored at said storage space after having said allocated storage space filled, shall replace the oldest information stored at said allocated storage space.

20 21. A DSLAM according to claim 14, wherein said plurality of communication signals conveyed along a broadband network comprises at least a voice signal directed to a subscriber, and wherein said storage means is adapted to store said voice signal.

25 22. A DSLAM according to claim 17, adapted to forward to the subscriber said stored voice signal in response to information received from said subscriber.

30 23. A DSLAM according to claim 1, further adapted to associate one or more of the video signals stored at said storage means for a subscriber, and forward said one or more video signals to the subscriber in response to a command received from said subscriber.

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24. A DSLAM according to claim 1, wherein the information received from the subscriber comprises media content and said media content is stored thereat.

5 25. A DSLAM according to claim 1, wherein said storage means is a member of the group consisting of solid-state storage, a mechanical storage and a combination thereof.

10 26. A DSLAM according to claim 1, wherein part of the capacity of said storage means is reserved for media content associated with one or more of the subscribers.

15 27. A DSLAM according to claim 1, wherein said storage means is further provided with storage formatting means, operative to allocate different storage sizes out of said storage means in accordance with the media content and/or application to be stored.

20 28. A DSLAM according to claim 1, wherein at least part of the capacity of said storage means is allocated so that to each of the subscribers associated with said DSLAM there is a defined and fixed capacity reserved.

25 29. A DSLAM according to claim 1, wherein any part of said storage means is adapted to be used by any of the subscribers associated with said DSLAM.

30 30. A DSLAM according to claim 1, wherein said storage means is further provided with storage formatting means, operative to allocate different storage sizes in accordance with the application to be stored and a service provisioning agreement pre-signed with the respective subscribers.

35 31. A DSLAM according to claim 1, wherein at least part of said storage means is divided and each of its divided

parts is associated with a subscriber so as to enable storage of information per that subscriber requirements and/or commands.

5 32. A DSLAM according to claim 30, where at least one of said divided parts is integrated with a broadband modem connecting said DSLAM with a subscriber.

33. A DSLAM according to claim 1, further comprising
10 backup storage means, operative to provide a backup for at least part of the communication signals' content stored at said storage means.

34. A DSLAM according to claim 32, wherein said backup
15 storage is further provided with sorting means to determine the communications signals' content that will be stored at said backup storage means in accordance with at least one pre-defined criterion associated with the media content and/or application.

20 35. A DSLAM according to claim 32, wherein said backup storage is further provided with sorting means to determine the communications signals' content that will be stored at said backup storage means in accordance with
25 a service agreement pre-signed with the respective subscribers.

36. A video broadcasting system adapted to provide TV
30 broadcasting services and at least PVR services, which system comprises:

broadcasting means operative to multicast video signals to a plurality of DSLAMs, each comprising:

a network side interface adapted to receive a
35 plurality of video signals from said broadcasting means;

a storage means adapted to receive at least some of said plurality of video signals, and store their content;

5 a subscribers' output interface adapted to receive video signals from said DSLAM and forward it along a communication line extending towards a subscriber; and

10 a subscribers' input interface adapted to receive information generated by the subscribers, wherein said DSLAM is operative to start storing said multicasted video signals upon receiving a first command from said subscriber and convey the stored video signals to said subscriber upon receiving a second command from said subscriber.

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37. A method for establishing a connection between a DSLAM and a subscriber for providing a video service to said subscriber, which method comprises:

20 (i) receiving a request initiated by a user for a video service;

(ii) determining whether a sufficient bandwidth has been allocated for said user to fulfill said request, and if not, rejecting said request;

25 (iii) determining whether said request can be fulfilled by utilizing a channel broadcasted by a TV broadcasting service and if in the affirmative, setting at said DSLAM a high priority connection between said subscriber and a multicast stream reaching said DSLAM, and comprises said channel;

30 (iv) if by said step (iii) it is determined that said request cannot be thus fulfilled, determining if the subscriber's request can be fulfilled by using a network PVR and if in
35 the affirmative, storing the content of said

multicast stream at a storage comprised in said DSLAM, establishing a virtual high priority connection between said DSLAM and said subscriber, and upon receiving a command from said subscriber to provide said video service, transmitting stored video signals while continuing to store the incoming multicast signal at said storage.

38. A method according to claim 37, further comprising the step:

(v) if by said step (iv) it is determined that said request cannot be thus fulfilled, determining whether the requested content is available on local replica of a VoD server and if in the affirmative, setting a direct high priority, unicast connection between said VoD server and said subscriber, and forwarding the requested content to said subscriber.

39. A method according to claim 38, further comprising the step:

(vi) in case the requested content is not available on local replica of a VoD server, retrieving said requested content from another VoD server associated with a network with which said local VoD server is associated and transmitting said requested content to said subscriber.

40. A method of providing TV broadcasting services and at least PVR type of services, which method comprises:

broadcasting multicast video signals to a plurality of DSLAMs,

at at least one of said plurality of DSLAMs, receiving said multicast video signals and storing

the content of at least some of said multicast video signals;

forwarding video signals to at least one of a plurality of subscribers associated with said at least one DSLAM;

wherein storing of said multicasted video signals is carried upon receiving a first command from said at least one subscriber and said stored video signals is forwarded upon receiving a second command from said subscriber.

41. A method* for managing storage capacity at a DSLAM which comprises:

(i) determining whether a storage associated with at least one subscriber is partially or completely empty;

(ii) if in the affirmative, determining whether high priority video stream data is available, and if such data available, storing some or all of said data at said storage;

(iii) determining whether said storage is still partially or completely empty after carrying out step (ii) and if in the affirmative, determining whether low priority video stream data is available, and if such data available, storing some or all of said data at said storage;

(iv) determining whether said storage is still partially or completely empty after carrying out step (iii) and if in the affirmative, determining whether there is Internet data available, and if such data available, storing some or all of said data at said storage; and

- (v) repeating steps (i) to (iv) every pre-determined period of time.